

TITLE: ULTRASTRUCTURAL CHANGES OF TOBACCO CELL WALLS BY
CALCIUM EXTRACTION

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ABSTRACT: The role of calcium in plants has been the subject of research for many years. Calcium has been postulated to cover a wide variety of functions which have major and minor influences on plant metabolism. Calcium interaction with pectin has been postulated as a major source of cell wall stability, however, no direct measurements of this interaction have been made. In this study, a sequential extraction method has been utilized to fractionate the various forms of calcium present in cured bright and burley tobaccos. The extraction method uses water, potassium chloride, lanthanum chloride and hydrochloric acid. These data, in conjunction with light microscopy (LM) and transmission electron microscopy (TEM) data, have been used to predict the role of structural calcium in the cell wall. Oxalate and calcium analyses have been made at each of the extraction steps for bright tobacco. It can be shown that the major portion of the calcium extracted is not associated with oxalate except for the hydrochloric acid step. The solubility studies of calcium and the ultrastructural studies of the extracted leaf help to provide a greater understanding of the role calcium plays in the structural support of the cell wall.

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